INSTRUCTIONS AK GEJ-2420

TYPE AK-4

HOOK-ON VOLT-AMMETER

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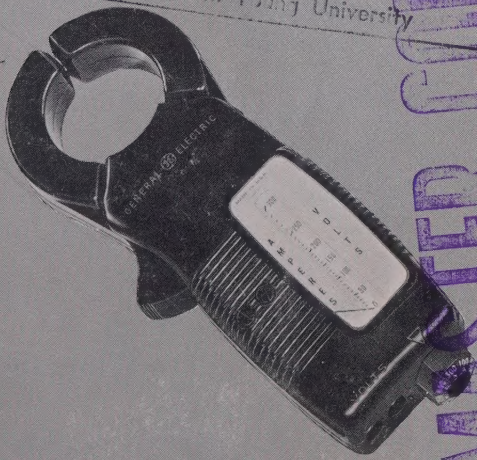


GENERAL ELECTRIC

3 SIMPLE OPERAT

TO MEASURE CURRENT . . .

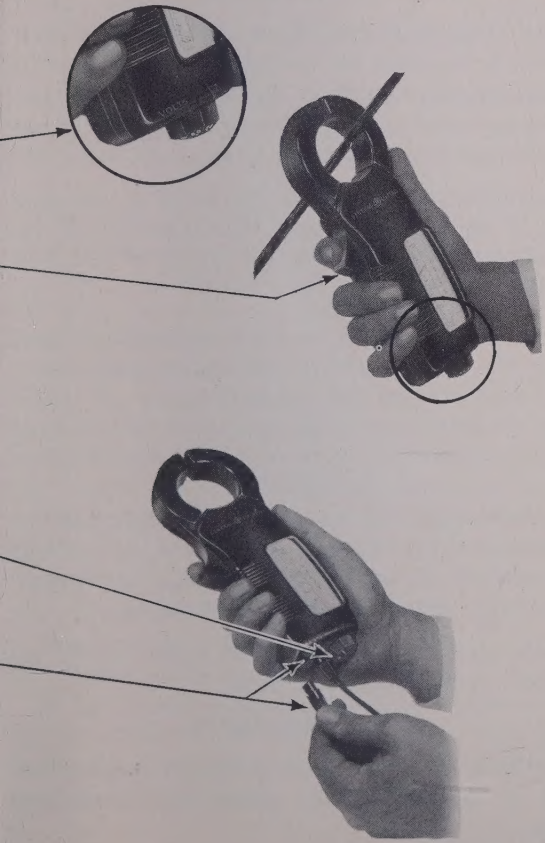
1. Turn selector knob to proper current range.
2. Open hook by pressing trigger; place hook around only the conductor to be measured.
3. Release trigger and read instrument.

TO MEASURE VOLTAGE . . .

1. Turn selector knob to proper voltage range.
2. Screw leads into instrument and connect clips to circuit.
3. Read instrument.

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.

G STEPS . . .



TYPE AK-4
HOOK-ON VOLT-AMMETER

INTRODUCTION

Your General Electric Type AK-4 hook-on volt-ammeter is designed for convenient measurement of a-c voltages and currents. The hook-on feature permits measurements to be made on insulated and uninsulated circuits without any interruption of service.

Current measurements can be made at full-scale ranges of 10, 30, 100, 300, and 800 amperes, and voltage measurements at full-scale ranges of 150, 300, and 750 volts.

The instrument has a scale-and-range-changing mechanism which provides each of the eight instrument ranges with its own calibrated scale. A simple turn of the selector knob brings an entirely new scale into operation and at the same time makes the necessary internal circuit changes for the new range. An arrow molded on the case points to the range selected.

A pointer-stop mechanism is provided which allows measurements of current surges (such as motor-starting currents) and voltages of short duration.

The mechanism is operated by means of the red set-screw on the instrument cover.

OPERATING LIMITS

The Type AK-4 volt-ammeter has an accuracy rating of ± 3% of full scale when used on 60-cycle circuits.

When making current measurements, maximum accuracy will be obtained if the conductor is kept as close as possible to the center of the hook and the hook is fully closed.

Note: This instrument cannot be used to measure d-c voltages or currents.

Warning: Safety rules and other necessary precautions (such as keeping your hand away from any "hot" lines, etc.) must be observed when using this instrument.

The hook, although insulated when in the closed position, has a small uninsulated portion exposed when it is open. Therefore, to prevent short-circuits, keep the hook away from adjacent bare conductors or grounded surfaces.

Current measurements in circuits above 750 volts should not be made unless the conductors are adequately insulated to withstand the circuit voltages.

OPERATION

Your hook-on volt-ammeter has eight scale ranges, each of which may be centered in the window by turning the selector knob. A click will be "felt" when the scale is properly positioned.

Note that the voltage scales are marked in red and the current scales are marked in black.

When the approximate value of the current or voltage is not known, try the highest range first. If the indication is too small for an accurate reading, turn to a lower scale range.

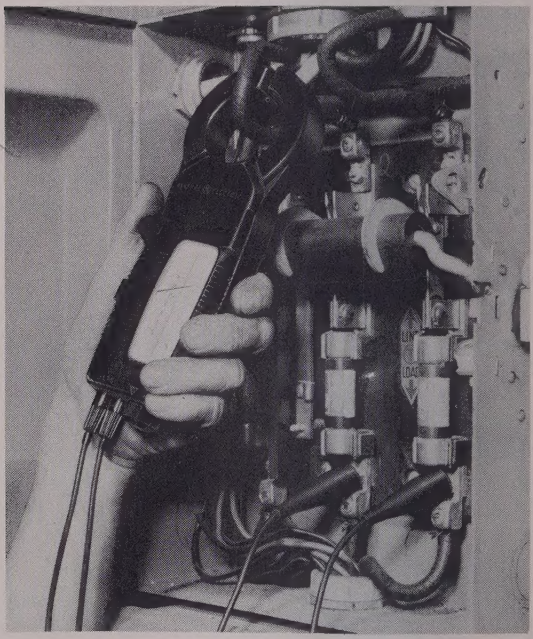


Fig. 1. Typical current and voltage measurement

For the best accuracy, the instrument pointer should be on zero before any connections are made. If an adjustment is necessary, turn the black set-screw on the instrument cover.

CURRENT MEASUREMENTS

Current measurements with a hook-on type of instrument, require that only one conductor (one "side" of the line) be placed inside of the hook. This is because the instrument operation depends on the magnetic field of the conductor which is enclosed in the hook. If both sides of the line are enclosed in the hook, the magnetic fields of the conductors will cancel, and therefore no reading will be obtained.

To measure current, proceed as follows:

1. Turn selector knob to proper range.
2. Press trigger to open the hook and pass *only* the conductor to be measured inside the hook.
3. Release the trigger and make sure the hook is fully closed. Maximum accuracy will be obtained if the conductor is as close as possible to the center of the hook.
4. Read the instrument.

VOLTAGE MEASUREMENTS

To measure voltage, proceed as follows:

1. Turn selector knob to proper range.
2. Screw the voltage-lead connectors into the holes beside the selector knob.
3. Clip the other end of the leads to the circuit.
4. Read the instrument.

EXTENDING THE INSTRUMENT RANGES

MEASUREMENT OF LOW CURRENTS

Full-scale ranges lower than 10 amperes can be obtained by passing the conductor two or more times through the hook. To determine the actual current, divide the instrument reading by the number of times the conductor is passed through the hook.

MEASUREMENT OF HIGH CURRENTS AND VOLTAGES

Currents and voltages above the highest instrument ranges may be measured by using suitable instrument transformers. For current measurements above 800 amperes, connect a jumper across the secondary terminals of a current transformer. Pass this jumper through the instrument hook enough times to obtain a satisfactory deflection of the instrument pointer.

Note: If the instrument-current transformer has a secondary rating of 5 amperes, which is usually the case, two passes of the jumper through the instrument hook will be sufficient to obtain satisfactory instrument-pointer deflection.

To determine the actual value of the line (primary) current, divide the instrument reading by the number of times the jumper is passed through the hook and multiply this result by the transformer ratio.

Warning: When this instrument is used with a current or potential transformer, the recognized safety precautions applying to the use of current or potential transformers should be followed. (Ground secondary; when using a curent transformer, do not open the secondary circuit without first short-circuiting the transformer secondary terminals; etc.) For voltage mea-

surements above 750 volts, connect the instrument voltage leads to the secondary terminals of a potential transformer. To determine the actual value of the line (primary) voltage, multiply the reading by the transformer ratio.

USE OF THE POINTER-STOP MECHANISM

The operation of the mechanism is as follows:

1. Connect the instrument. Then, select a scale range which results in a momentary deflection well up on the scale.
2. Rotate the red set-screw counterclockwise until the deflection of the pointer from the pointer stop is barely noticeable on repeated application of the measured quantity.
3. Read the instrument.

Note: The red set-screw must be rotated to its maximum clockwise position, when the pointer-stop mechanism is not in use.

The accuracy of such measurements is dependent on the duration of the impulse. The accuracy improves with longer durations.

MAINTENANCE

Keep the tips of the hook clean by wiping occasionally with an oily cloth.

To clean the plastic window, wash it with soap and water. To remove grease or oil, use kerosene sparingly. DO NOT use acetone, benzene, carbon tetrachloride, fire-extinguisher fluids, lacquer thinners, or window sprays containing these solvents, since they will smear and soften the window.

It is recommended that the window be wiped or blotted periodically with a clean damp chamois. Do

not rub the window with a dry cloth as this is likely to cause scratches and to build up an undesirable electrostatic charge. After cleaning, an anti-static agent such as Anstac "M"* may be applied very sparingly to the window. Care should be taken not to flood the window since an excessive amount of fluid will cause the window to crack.

If the window becomes scratched due to handling, the scratches may be removed or considerably reduced by appling a good auto-body cleaner. After the scratches are removed, wash off the cleaner and again apply an anti-static agent to the window.

SERVICING

If you need to repair, recondition, or rebuild any electric apparatus, a G-E service shop near you is available day and night, seven days a week, for work in the shop or on your premises. Latest factory methods and genuine G-E parts are used to maintain the original performance of your electric equipment.

When you need parts only, to replenish those you stock as "production insurance", your General Electric representative will service your request. Plan to stock and order far enough in advance to assure an adequate supply to meet normal requirements. The services of G-E factories and engineering divisions are always available to help you with your electrical problems. For full information about these services, contact the nearest General Electric service shop or sales office.

*Obtain from Chemical Development Corporation, Danvers, Mass.

OTHER GENERAL ELECTRIC HOOK-ON INSTRUMENTS

RECORDING VOLT-AMMETER

The Type CF-7 records a wide range of currents and voltages in a-c circuits. Consisting of a portable recorder and a butyl-molded hook-on transformer, the Type CF-7 can be used on circuits operating at potentials up to 8700 volts. Refer to GEC-1225.

WATT-VARMETER

The Type AK-2 instrument provides a means of measuring a-c power (watts) quickly and easily on insulated or uninsulated circuits. It is also possible to measure vars in balanced three-phase circuits. Refer to Bulletin GEC-901.

POWER-FACTOR METER

The Type AK-3 instrument provides a means of measuring power factor directly on any insulated, or uninsulated, balanced three-phase a-c circuit. Refer to Bulletin GEC-901.

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For further information, or copies of the above bulletins, contact the nearest General Electric apparatus sales representative.

INSTRUMENT DEPARTMENT

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